

Serial No. 09/842,731

IN THE CLAIMS

1. (Previously Amended) A direct current motor comprising a yoke housing and an armature rotatably received within said yoke housing, said yoke housing including:

a plurality of primary magnetic poles secured to an inner peripheral surface of said yoke housing for providing magnetic fields to said armature; and

a plurality of groove-like reduced thickness portions for increasing a magnetic resistance, said plurality of groove-like reduced thickness portions being integrally formed in said yoke housing, wherein:

a number of said plurality of groove-like reduced thickness portions is equal to a number of said plurality of primary magnetic poles; and

each said groove-like reduced thickness portion extends along a center line of a corresponding one of said plurality of primary magnetic poles and has an uncovered outer surface on an outside of said yoke housing to expose said entire outer surface of said groove-like reduced thickness portion to air.

2. (Previously Amended) A direct current motor according to claim 1, wherein each said groove-like reduced thickness portion is recessed in one of an outer peripheral surface and said inner peripheral surface of said yoke housing.

3. (Original) A direct current motor according to claim 1, wherein each said primary magnetic pole is configured such that said center line of each said primary magnetic pole extends linearly in an axial direction of said yoke housing.

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4. (Original) A direct current motor according to claim 1, wherein each said groove-like reduced thickness portion extends from one of opposing axial ends of said yoke housing for a length that covers an entire axial length of said corresponding one of said plurality of primary magnetic poles.

5. (Original) A direct current motor according to claim 1, wherein:
said yoke housing is formed as a generally oblate cylinder that includes opposing generally parallel flat sections and opposing arcuate sections; and
each said arcuate section has one of said plurality of primary magnetic poles secured to an inner peripheral surface of each said arcuate section.

6. (Original) A direct current motor according to claim 5, wherein said yoke housing is configured such that a wall thickness of each said flat section is larger than a wall thickness of each said arcuate section.

7. (Original) A direct current motor according to claim 5, wherein said wall thickness of each said arcuate section gradually increases from a circumferential center of each said arcuate section toward each one of opposing circumferential ends of each said arcuate section.

8. (Original) A direct current motor according to claim 1, wherein said plurality of primary magnetic poles include permanent magnets.

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9. (Original) A direct current motor according to claim 5, wherein a wall thickness of each said groove-like reduced thickness portion is equal to or less than 40% of a wall thickness of each said flat section.

10. (Previously Amended) A yoke housing of a direct current motor that includes an armature rotatably received within said yoke housing, said yoke housing comprising:

a plurality of primary magnetic poles secured to an inner peripheral surface of said yoke housing for providing magnetic fields to said armature; and

a plurality of groove-like reduced thickness portions for increasing a magnetic resistance, said plurality of groove-like reduced thickness portions being integrally formed in said yoke housing, wherein:

a number of said plurality of groove-like reduced thickness portions is equal to a number of said plurality of primary magnetic poles; and

each said groove-like reduced thickness portion extends along a center line of a corresponding one of said plurality of primary magnetic poles and has an uncovered outer surface on an outside of said yoke housing to expose said entire outer surface of said groove-like reduced thickness portion to air.

11. (Withdrawn)

12. (Withdrawn)

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13. (Previously Added) A direct current motor according to claim 1, wherein an axial extent of each groove-like reduced thickness portion is greater than an axial extent of any of said primary magnetic poles.

14. (Previously Added) A direct current motor according to claim 1, wherein each groove-like reduced thickness portion has a curved concave surface.

15. (Previously Added) A yoke housing according to claim 10, wherein each groove-like reduced thickness portion has a curved concave surface.

16. (Previously Added) A direct current motor comprising a yoke housing, which has a closed end and an open end, an armature rotatably received within said yoke housing, and a gear housing secured to said open end of said yoke housing such that a substantially closed space is formed in said yoke housing, said yoke housing including:

a plurality of primary magnetic poles secured to an inner peripheral surface of said yoke housing for providing magnetic fields to said armature; and

a plurality of groove-like reduced thickness portions for increasing a magnetic resistance, said plurality of groove-like reduced thickness portions being integrally formed in said yoke housing, wherein:

a number of said plurality of groove-like reduced thickness portions is equal to a number of said plurality of primary magnetic poles; and

each said groove-like reduced thickness portion extends along a center line of a corresponding one of said plurality of primary magnetic poles.

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17. (Previously Added) A direct current motor according to claim 16, wherein each groove-like reduced thickness portion has a curved concave surface.

18. (Previously Added) A direct current motor comprising a yoke housing, which has a closed end and an open end, and an armature rotatably received within said yoke housing, said yoke housing including:

a plurality of primary magnetic poles secured to an inner peripheral surface of said yoke housing for providing magnetic fields to said armature; and

a plurality of groove-like reduced thickness portions for increasing a magnetic resistance, said plurality of groove-like reduced thickness portions being integrally formed in said yoke housing such that one end of each groove-like reduced thickness portion is located in one of said closed end and said open end of said yoke housing, wherein:

a number of said plurality of groove-like reduced thickness portions is equal to a number of said plurality of primary magnetic poles; and

each said groove-like reduced thickness portion extends along a center line of a corresponding one of said plurality of primary magnetic poles.

19. (Previously Added) A direct current motor according to claim 18, wherein the other end of each groove-like reduced thickness portion is positioned away from the other one of said closed end and said open end of said yoke housing.

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20. (Previously Added) A direct current motor according to claim 18, wherein each groove-like reduced thickness portion has a curved concave surface.

21. (New) A direct current motor according to claim 18, wherein each groove-like reduced thickness portion has a high-magnetic resistance to thereby reduce magnetic flux induced by an armature magnetomotive force.

22. (New) A direct current motor according to claim 16, wherein each groove-like reduced thickness portion has a high-magnetic resistance to thereby reduce magnetic flux induced by an armature magnetomotive force.

23. (New) A direct current motor according to claim 10, wherein each groove-like reduced thickness portion has a high-magnetic resistance to thereby reduce magnetic flux induced by an armature magnetomotive force.

24. (New) A direct current motor according to claim 1, wherein each groove-like reduced thickness portion has a high-magnetic resistance to thereby reduce magnetic flux induced by an armature magnetomotive force.